GOLDEN BRIDGE TECHNOLOGY

Presentation on RP-010-222: Traffic characteristics of various 3G non real time services

GBT Inc

Agenda item 6.11

RAN#11, March 13-16

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Partial List of services that benefit from CPCH

1. Unified messaging
2. M commerce transactions
3. **Multi-media messaging (text, graphic, image, video)**
4. M2M (remote monitoring and surveliance)
5. B2B business applications
6. Multimedia messaging
7. Tracking, localized information
8. Location-based billing
9. **Location-based M commerce**
   Navigation/ location
11. Entertainment
12. financial services
13. **Mobile internet access**
14. **Mobile intranet access (office extension/ VHE)**

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UMTS Report #11

1. Infotainment and edutainment:

Games and remote gambling/ location based travel information

2. B2C:

New Customer and Field Sales

Customer care: expert on call

Field Service: VHE

3. Office Extension:

Tele-working/ intranet access

VHE / personal service profile anywhere/anytime

White boarding / collaborative work

PDA Synch

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UMTS Report number 11

4. Telemedicine

patient monitoring

Physicians accessing patient information

Ambulances

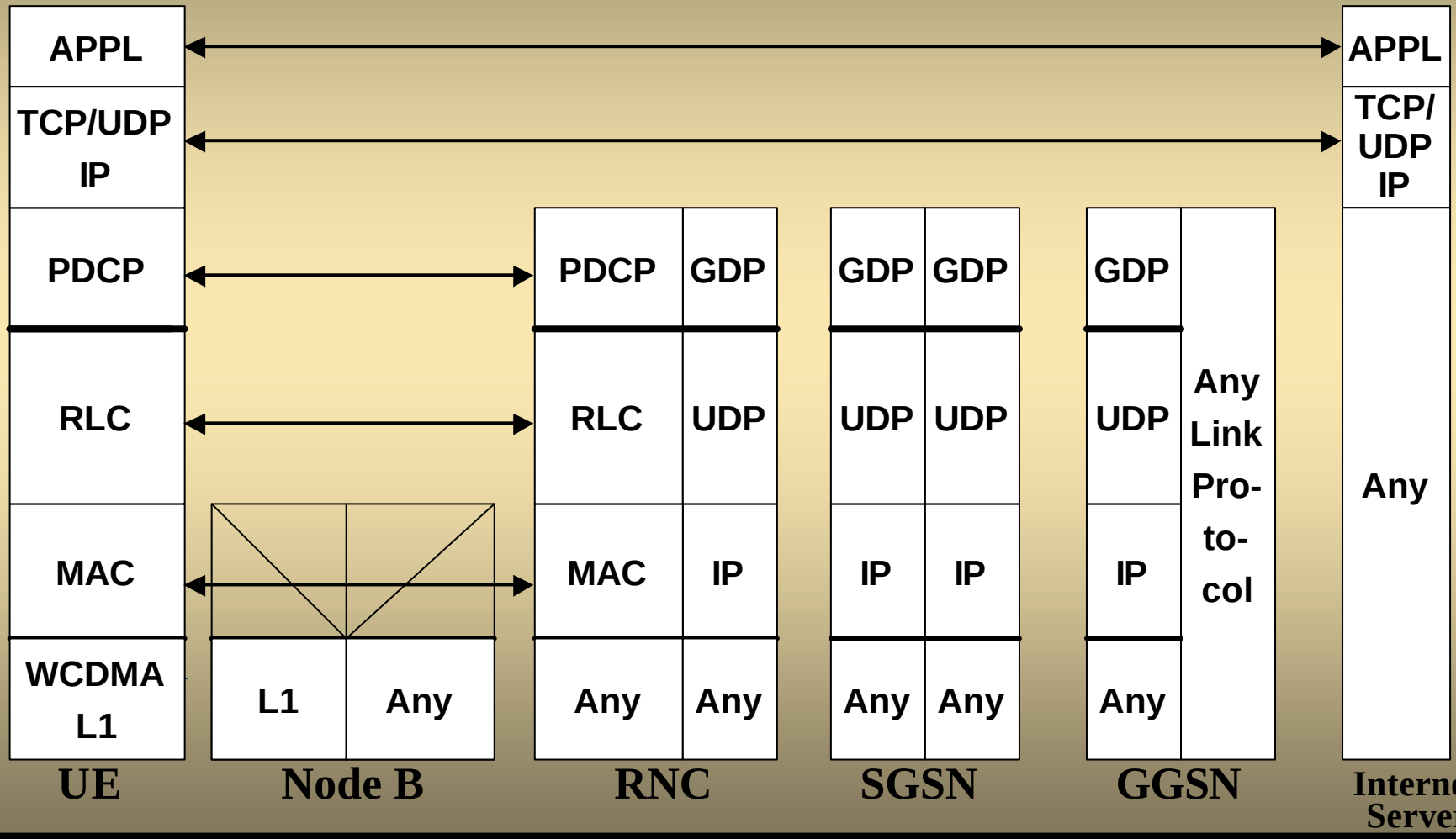
5. Telematics / telemetry/monitoring

Self diagnostic check/ exact location of vehicles

6. Location based services:

Navigation/ reservation/ Ordering, translation services based on location, End user assistance, Monitor person location/health care/ prisoner tagging/ emergency calls, third party tracking/ fleet management/asset tracking/ people finding, trigger service/ location based billing/services

3GPP Packet Service protocol Stack



CPCH / DSCH or CPCH / FACH

Table 1.Uplink Message sizes for Data Services

Service	Range of Uplink Message Sizes
Multimedia Messaging Services (MMS) Signaling requirement [100 bytes-1 Kbytes]	[1 kbytes … 100 Kbytes]
Location Base Services	[Measurements 30 Bytes … 149 Bytes]
Mobile Internet [Uplink Requirements] Web browsing application	[10 Bytes … 1400 Bytes]
Transaction based Services (Mobile Commerce)	Medium size [Preliminary: > 100 Bytes]
Telemetry, Tele-medicine	Small to medium (Tele-Medicine may be much bigger if one includes e.g. X-ray pictures)
Signaling traffic to initialize the above listed service connections	[1 byte … 4 Kbytes]

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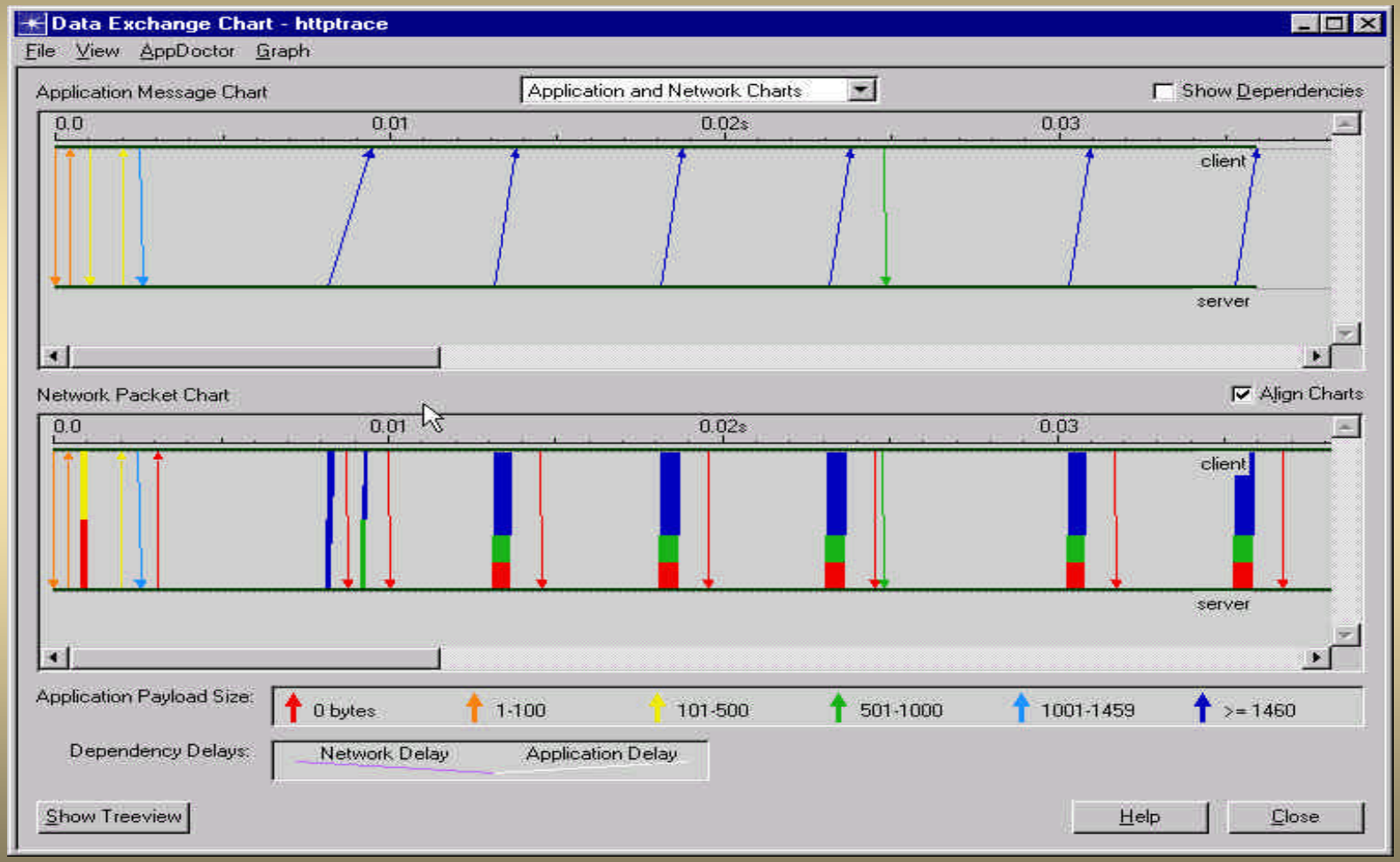
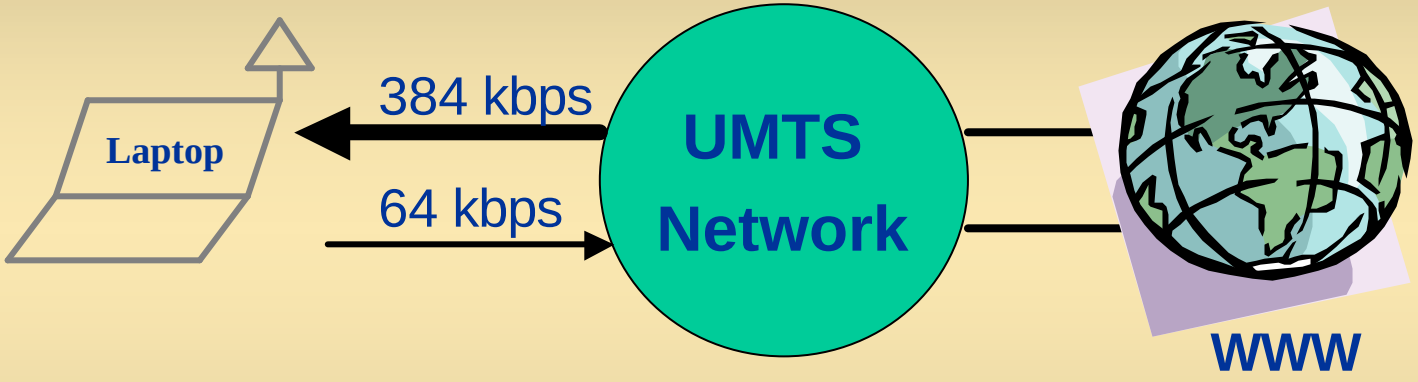
HTTP Tracing Diagram



Infotainment
Mobile Internet



New Multimedia Message Received

Instant delivery

... like SMS!

Combination of:

- **Plain Text**
- **Images**
- **Audio**
- **Video**

... like MIME Email!

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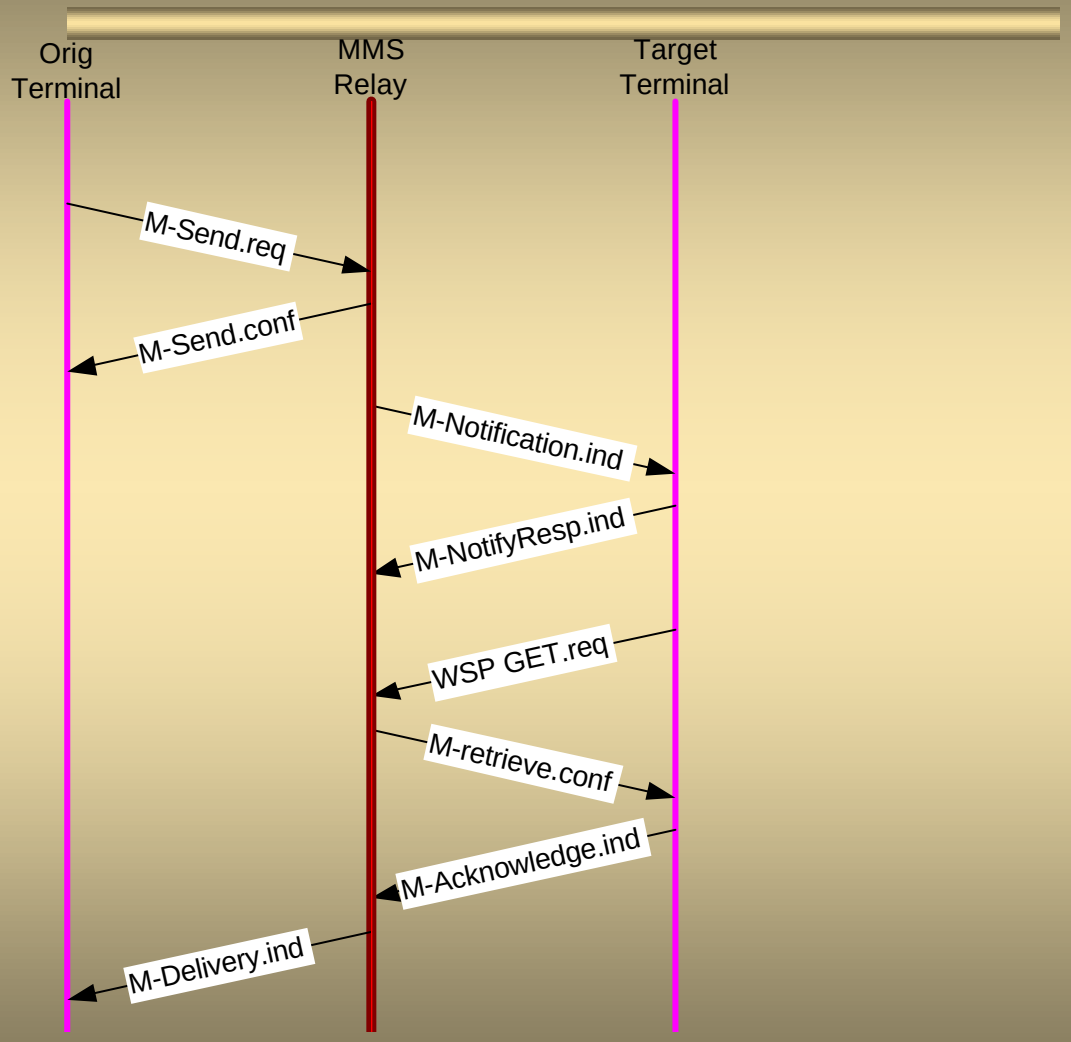
Example MMS Transactional Flow in WAP



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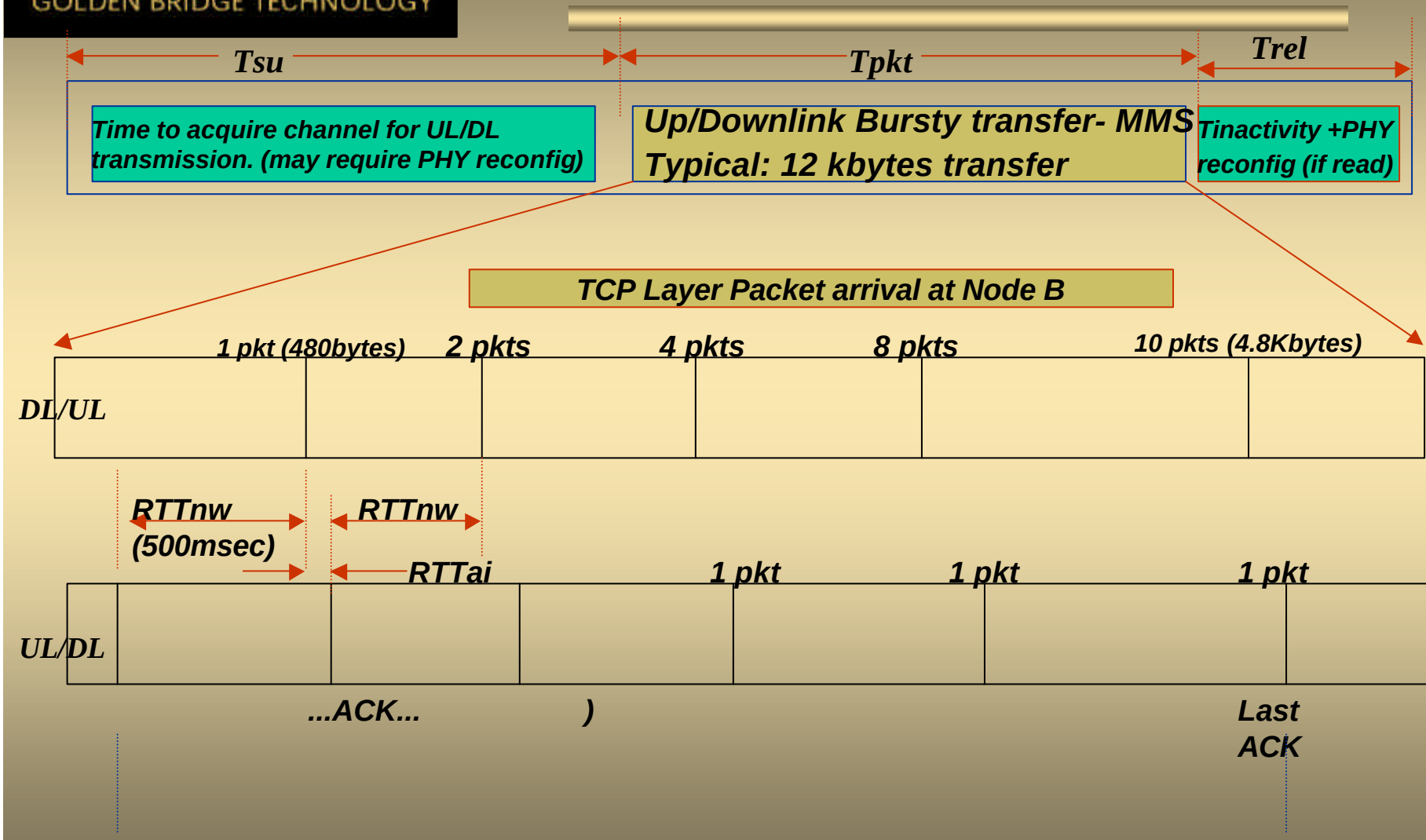
WAP-based MMS message Sizes

PDU	Estimated Uplink Data Volume (octets)	Estimated Downlink Data Volume (octets)
M-send.req	1k … 1,100k	-
M-send.conf		~100
M-notification.ind	~100	-
M-NotifyResp.ind		~100
WSP GET.req	100 … 1k	
M-Retriev.conf		1k … 1,100k
M-acknowledge.ind	~100	
M-delievey.ind	100 … 1k	

Typical MMS transfer using TCP/IP



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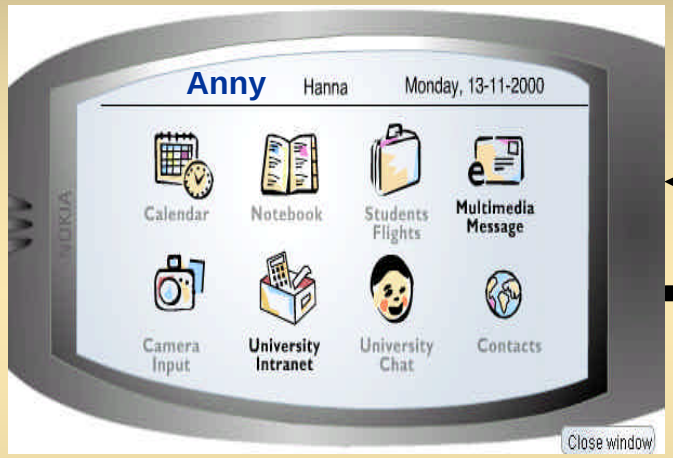
Transaction Based Applications



64 kbps

64 kbps

UMTS Network

MMS Server

IM, UM, EMS, MMS, Mobile commerce, transactions, interactive games
B2C services

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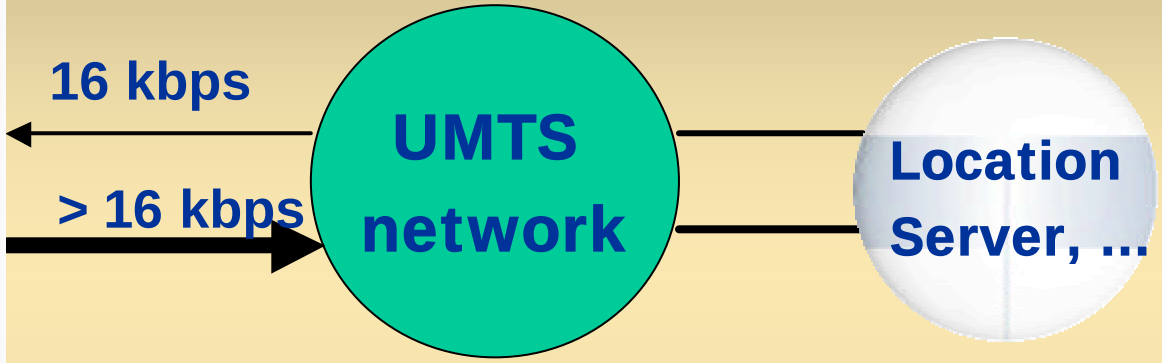
Uplink messaging Requirements for positioning method

	Assisted	Non-Assisted
GPS	21-149 Bytes Range of Sats = 0-6 Sats Reasonable Value (3 Sats) = 106 Byte (149 bytes for 6 Sats)	10-30 Bytes 30 Bytes
OTDA	14-186 Bytes Range of cells = 0-32 Reasonable value = 5 cells 68 Bytes	10-30 Bytes 30 Bytes

Location Based, Remote Monitoring, M2M, Telemetry, Telematics



CPCH / DSCH or CPCH / FACH

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Uplink Signaling requirements

(all below values are for uncoded data, double these for R= 1/2 coding on PHY)

	MIN	MAX
1. Cell Update	16 bytes	41 bytes
2. URA Update	11 bytes	
3. UE Capability Info	29 bytes	541 bytes
4. RRC Connection Request	14 bytes	30 bytes
5. Inital Direct Transfer	12 bytes	4 Kbytes
6. Uplink Direct Transfer	12 bytes	4 Kbytes
7. RRC Connection Complete	7 bytes	558 bytes
8. Physical Chan Reconfig Complete	9 bytes	170 bytes
9. Measurement report:	4-20 Bytes	

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IP Call Set up example

- UE -> UTRAN: RRC Connection Request (10 Bytes)
- UTRAN -> UE: RRC Connection Set up
- UE -> UTRAN: RRC Connection Set up complete (190 Bytes)
- UE -> CN: Attach request (14 Bytes)
- CN-> UE: Identity request
- UE->CN: Identity response (6 bytes)
- CN -> UE: Attach Accept (11-37 Bytes)
- UE-> CN: Attach Complete (2 Bytes)
- CN-> UE: Authentication Request (19-37 Bytes)
- UE->CN: Authentication Response (11 Bytes)
- UE-> CN: Activate PDP Context Request (130 Bytes)
- CN -> UE:Activate PDP context accept (5-281 Bytes)
- RAN->UE: Physical Channel reconfiguration Request
- UE - > RAN: Physical Channel reconfiguration Complete (60 Bytes)

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RACH versus CPCH versus DCH

- RACH limited to less than 36 Bytes: 60 kbps and 10 ms load
- CPCH can accommodate loads ranging from 0 Bytes- 38.4 Kbytes in a single CPCH transmission. File transfers of up to 100 Kbytes is easily achievable while maintaining the spectrum efficiency gain as compared to DCH at the high end.
- DCH should be utilized for more continuous-like loads and very large files

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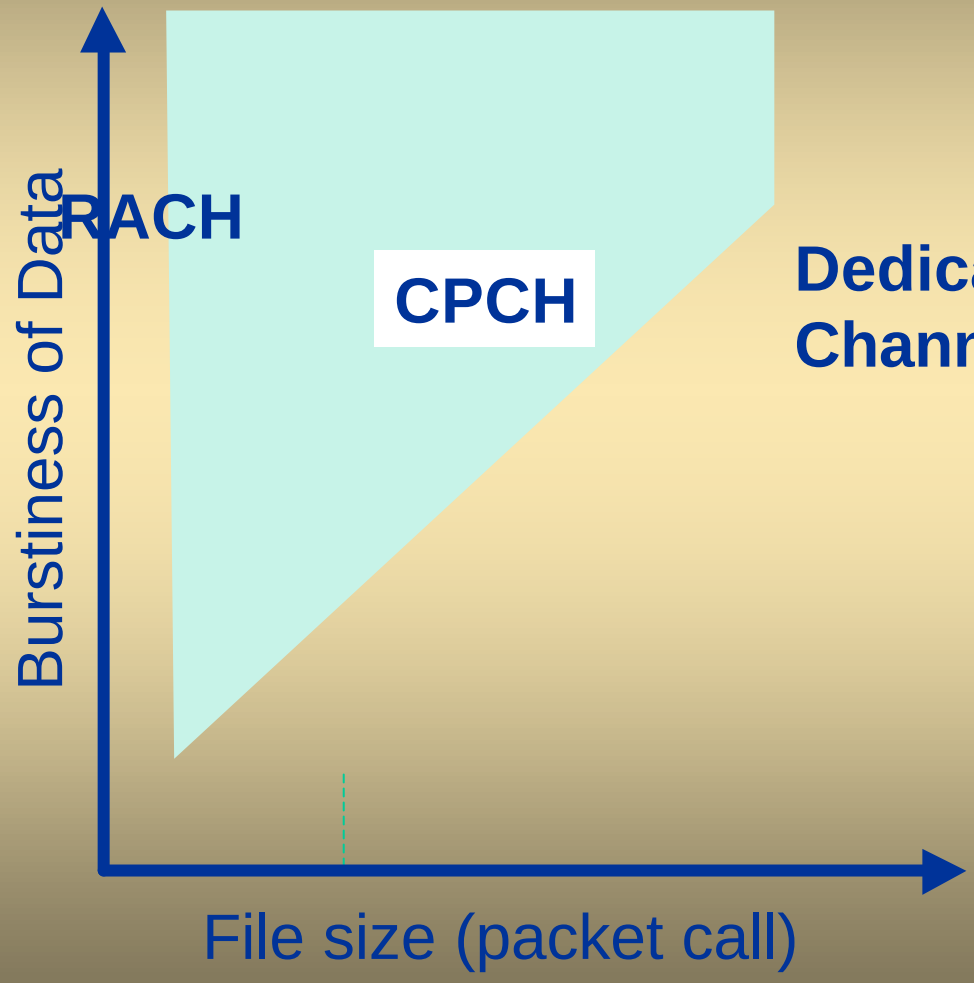
Best Means for Uplink Transmissions



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Conclusions

Majority of the UMTS forum services (#11) benefit from the use of CPCH directly (size and bursty-ness perspectives)

Next contribution: CPCH/FACH or CPCH/DSCH are optimized methods for these non real time services